

What is claimed is:

1. An inverted microscope comprising:
 - an objective lens disposed below a sample;
 - an image-forming lens for focusing observation light from said objective lens, said image-forming lens imaging said observation light at a focal plane;
 - a reflecting mirror for directing transmitted light passing through said image-forming lens to a front side of the microscope;
 - a first optical element for directing light from said image-forming lens to an imaging optical path extending to a backside of the microscope, said first optical element disposed between said image-forming lens and said reflecting mirror;
 - a port in said microscope, said imaging optical path passing through said port; and
 - an imaging device coupled to said port, said imaging device having an image plane, said image plane substantially corresponding to said focal plane.
2. The inverted microscope according to claim 1, wherein said image-forming lens forms a primary image and further comprising:
 - a relay lens for relaying said primary image to said focal plane; and
 - an adjusting device for changing a distance between said image plane and said focal plane, said adjusting device disposed between said port and said imaging device.
3. The inverted microscope according to claim 2, wherein said imaging optical path comprises an optical axis, and said

adjusting device moves said image plane in the direction of said optical axis and a direction perpendicular to said optical axis.

4. The inverted microscope according to claim 1, further comprising:

viewing optics disposed in an observation optical path extending from said reflecting mirror, said viewing including a photo mask; and

an adjusting device for moving said imaging device in the direction of an optical axis of said imaging optical path and a direction perpendicular to said optical axis until a central portion of said image plane coincides with a central position of said photo mask, said adjusting device attached to said port.

5. The inverted microscope according to claim 1, further comprising:

a lamp housing containing a reflected illumination light source; and

a reflected illuminator attached to said lamp housing, said reflected illuminator attached in the backside of the microscope and having a shape bent such as to direct light in a predetermined direction

6. The inverted microscope according to claim 1, further comprising:

a first light source for emitting excitation light to illuminate the sample via said objective lens;

a second optical element for directing said excitation light to the sample and transmitting observation light from

the sample, said second optical element disposed in an observation optical path along an optical axis of said objective lens;

a second light source for emitting a laser beam incident on the sample via said objective lens;

a third optical element for directing said laser beam from said second light source to the sample, transmitting said observation light from the sample and directing said observation light to said first optical element, said third optical element disposed in said observation optical path where said observation light has been transmitted through said second optical element;

an image-forming lens for said laser beam for focusing said laser beam on the sample, said image-forming lens for said laser beam disposed between said second light source and said third optical element; and

a lens holder for supporting said image-forming lens for said laser beam to enable movement of said image-forming lens for said laser beam in a direction of an optical axis of said laser beam, said lens holder adjusting a position of said image-forming lens for said laser beam so that said laser beam is focused on an appropriate position for said objective lens.

7. The inverted microscope according to claim 6, further comprising:

a moving mechanism for removing said first optical element and said third optical element from said observation optical path at the same time.

8. The inverted microscope according to claim 7, further

comprising:

a total transmission prism; and wherein:

said first optical element comprises a total reflection prism, said total transmission prism being switched with said total reflection prism by using said moving mechanism, and being disposed in said observation optical when said third optical element and said total reflection prism are removed from said observation optical path, said moving mechanism holding said total reflection prism and said total transmission prism side by side in a direction that said moving mechanism moves, and a distance between said total reflection prism and said total transmission prism being longer than a half of a maximum diameter of said observation light.

9. A microscope comprising:

an objective lens;

a first light source for emitting excitation light to illuminate a sample via said objective lens;

a second light source for emitting a laser beam to illuminate the sample via said objective lens;

an image-forming lens for said laser beam for focusing said laser beam on the sample via said objective lens; and

a lens holder for supporting said image-forming lens for said laser beam to enable moving said image-forming lens for said laser beam in a direction of an optical axis of said laser beam, said lens holder adjusting a position of said image-forming lens for said laser beam so that said laser beam is focused on an appropriate position for said objective lens.

10. The microscope according to claim 9, further comprising:

a first optical element for directing said excitation light to the sample and transmitting observation light from the sample, said first optical element disposed in an observation optical path along an optical axis of said objective lens;

a second optical element for directing said laser beam from said second light source to the sample and transmitting said observation light from the sample, said second optical element disposed in said observation optical path after said observation light has been transmitted through said first optical element;

a third optical element for directing said observation light transmitted through said second optical element to an imaging optical path by directing it to a port, said port placed in a position which said observation light passes through; and

a moving mechanism for removing said second and third optical elements from said observation optical path at the same time; wherein said objective lens is disposed below said sample, and said image-forming lens for said laser beam is disposed between said second light source and said second optical element.

11. The microscope according to claim 10, further comprising a total transmission prism;

wherein said third optical element comprises a total reflection prism, said total transmission prism is selectively switched with said total reflection prism by using said moving mechanism, and is disposed in said

observation optical path when said second optical element and said total reflection prism are removed from said observation optical path, said moving mechanism holding said total reflection prism and said total transmission prism side by side in a direction that said moving mechanism moves, and a distance between said total reflection prism and said total transmission prism being longer than a half of a maximum diameter of said observation light.